REMARKS

Claim 22 has been amended to provide proper antecedence. No new matter has been entered. Upon entry of this amendment, claims 1-24 will remain pending.

Claim Objection

Claim 22 stands objected to as being a method claim improperly dependent upon a system claim. Claim 22 has been amended to depend from method claim 3 so as to obviate this objection. Withdrawal of the objection to claim 22 is solicited.

Rejection Under 35 U.S.C. §102(e)

Claims 1-24 stand rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Kraisser et al. (US 2002/0147654) ("Kraisser"). This rejection is respectfully traversed.

Exemplary claim 1 relates to a scheduling and routing system for delivering a consumable to customers via commercial delivery vehicles. Such a system comprises:

> a delivery forecasting system that maps certain customers to delivery profiles for similarly situated customers to provide variable statistical parameters for inventory replenishment of the consumable; and
>
> an integrated inventory replenishment, scheduling and routing system that generates a delivery route for a commercial delivery vehicle based on said statistical parameters and other variable parameters including road routing economics of making several deliveries in sequence before replenishment of the commercial delivery vehicle.

Claim 3 is directed to a method of forecasting consumption and generating optimal delivery schedules for delivery of consumables to customers by commercial delivery vehicles, while claim 8 relates to a corresponding program storage device. Claims 13, 15, and 17 are similar to claims 1, 3, and 8, respectively, except that claims 13, 15, and 17 are directed to a system, method, and a corresponding program storage device for providing "periodically scheduled services" instead of delivering a "consumable" to customers. The teachings of Kraisser are not particularly relevant to such systems, methods, and program storage devices and certainly are not anticipatory. The rejection over Kraisser is thus traversed.

At the outset, Applicant notes that the claimed systems, methods and program storage devices have a totally different purpose and operation than the systems, methods and program storage devices disclosed by Kraisser. For example, the claims are directed to a scheduling and routing system and method for deliveries of propane and other consumables and/or periodic services via trucks with finite capacity. In accordance with a first claimed feature, certain customers are mapped to delivery profiles for similarly situated customers to provide variable statistical parameters (*e.g.*, expected consumption parameter and an estimate of the variability of the expected consumption parameter) for inventory replenishment of the consumable or for providing periodically scheduled services. In accordance with a second claimed feature, the specific road routing economics are combined with the variable statistical parameters to generate a delivery route for delivering propane and other consumables and/or periodic services. The result to the user is a delivery system that provides the consumable and/or periodic services in a highly efficient manner without running out of the consumable on the delivery route or missing periodic services.

In contrast with the claimed systems, methods, and program storage devices, Kraisser seeks to provide a delivery scheduling system that only schedules deliveries within a particular time window if: (1) it is possible to make all scheduled deliveries within the time window; and (2) it makes business sense to make each delivery within the time window (Paragraph [0012]). This objective is accomplished by providing a system and method for: (1) identifying a time window in which a requested delivery may be made to a customer; (2) determining a cost of delivery that includes the cost of making the requested delivery to the customer within the time window; (3) comparing the cost of delivery with a threshold cost; and (4) responsive to the cost of delivery being less than the threshold cost, indicating that the time window is available for the delivery.

Although both systems deal with scheduling, the similarities end there. First, the claimed systems, methods and program storage devices address management of the customer's inventory, which is not at all Kraisser's concern. Kraisser is instead concerned with delivering the customer's product within a particular time window. To put it another way, the claims provide techniques for scheduling periodic services and periodic deliveries of products (such as propane) that are consumed by the customers at some rate and the product must be replenished before the product is used up. By contrast, Kraisser's technique is more akin to a customer scheduling the delivery of a purchased appliance or cable repair services during a particular time window. These are different issues with different design solutions.

For example, such systems differ with respect to their handling of the demand, the objective of their routing optimization, and their use of priorities.

Handling of the demand

Kraisser's system is designed to accept the delivery demand specified by a customer. This demand could be specified by the customers themselves (as in the example provided) or through an order entry clerk. In contrast, the claimed systems, methods, and program storage devices determine the customer needs predicated on forecasting parameters statistically derived from the customer's consumption history by, for example, mapping "certain customers to delivery profiles for similarly situated customers to provide variable statistical parameters for inventory replenishment of the consumable" (claim 1). Given that the customer specifies the delivery time window, Kraisser clearly does not disclose "a delivery forecasting system" as claimed.

Also, Kraisser processes each customer demand when it is received and determines their schedule assignment only predicated on the current fixed status of the schedule because all previously scheduled deliveries have been committed to customers and therefore cannot be changed. In contrast, the claimed systems, methods, and program storage devices use delivery forecasting to determine the demand of all eligible customers before attempting to build a schedule and committing to a delivery for any of the customers. This difference provides opportunities for optimization that is not available to Kraisser.

Objective of routing optimization

Kraisser sequentially commits deliveries to customers in a particular time window on a First Come First Serve basis, thereby assuring non-optimality. The schedule driver is that the customer's delivery is in a particular time window. In contrast, the claimed systems, methods, and program storage devices use the delivery forecasting system to consider estimated demand of many customers when generating the delivery schedule, thereby allowing an optimal routing choice for the deliveries.

In addition, Kraisser only assures feasibility of the delivery schedule. In this regard, Kraisser's use of routing is only helpful in evaluating the cost of delivery with more accuracy and in maximizing the use of each particular time window across available vehicles. Importantly, Kraisser does not determine an optimal route except within a particular time window and only then through use of a "commercially available routing and scheduling program." (Paragraph [0112]). Thus, even Kraisser acknowledges that his system is not a delivery scheduling system but that a "commercially available" delivery scheduling system may be used with his system as desired. In contrast, the claimed systems, methods, and program storage devices assure both optimality and feasibility by integrating the inventory replenishment and delivery scheduling taking into account the status of the inventory and the road routing economics of making several deliveries in sequence. The claimed technique allows assignment to a (any) route - not assignment to a particular time window on a route.

Use of priorities

Kraisser determines priority on the basis of an arbitrary "business sense" relating the cost of making the delivery to the value of the merchandise being delivered. In contrast, the claimed systems, methods, and program storage devices determine priority based on the calculated risk that the customer's inventory will be depleted before the next delivery is made.

Applicant also notes that the priorities defined in Kraisser are static (*i.e.*, a customer will have the same priority regardless of the day of their order). In contrast, the priority scheme of the claimed systems, methods, and program storage devices is dynamic in that a customer with low priority will assume a higher priority later as the customer's inventory is being depleted. Kraisser does not give any provision for later scheduling of customers that cannot be currently served or in varying priority of the customer based on the need to replenish the customer's inventory of the consumable before the consumable is depleted.

In summary, Kraisser addresses a completely different delivery problem using a completely different implementation that does not take into account the customer's delivery profile for replenishment of inventory of the consumable or the provision of periodic services or schedule delivery taking into account the status of the inventory as well as other variables including road routing economics. Accordingly, Kraisser does not anticipate the claimed systems, methods and program storage devices and withdrawal of the rejection of claims 1-24 over Kraisser is solicited.

Rebuttal of Examiner's Comments Regarding Applicability of Kraisser

With respect to independent claims 1, 3, and 8, the Examiner alleges that Kraisser discloses the claimed scheduling and routing system for delivering a consumable to customers via commercial delivery vehicles. In particular, the Examiner alleges that Kraisser discloses the claimed "delivery forecasting system" in the Abstract and paragraphs [0060]-[0061] of the Kraisser patent. Applicant disagrees. Neither the Abstract nor paragraphs [0060]-[0061] of the Kraisser patent makes reference to "variable statistical parameters" or "delivery profiles." The Examiner is asked to note that the "various attributes of the customer requesting the delivery and the percentage of the delivery capacity associated with the delivery wave that has been reserved for previously scheduled deliveries" (Abstract) has nothing to do with the claimed "variable statistical parameters" that may include, for example, an "expected consumption parameter" and an "estimate of the variability of the expected consumption parameter" (claim 19). This distinction is clear from the definitions provided by Kraisser in paragraphs [0050] and [0051] of the Kraisser patent.

The Examiner also alleges that Kraisser discloses the claimed "integrated inventory replenishment, scheduling and routing system" in paragraph [0112] of the Kraisser patent. Again, Applicant disagrees. Paragraph [0112], as well as the rest of the Kraisser patent, makes no reference to inventory replenishment. Furthermore, the integration referred to in claim 1 pertains to the role of the statistical parameters, which determine inventory management in controlling the routing process. Kraisser does not suggest how a routing package is used and under what set of constraints it operates and certainly does not integrate the routing package with inventory replenishment.

With respect to claims 2 and 4, the Examiner alleges that Kraisser further disclose the claimed system wherein the integrated replenishment, scheduling and routing system includes an algorithm for optimal route generation and an algorithm for optimal delivery day selection in paragraphs [0107] and [0112]. Applicant disagrees. Kraisser does not refer to an algorithm for delivery day selection. Instead, Kraisser simply accepts the "appropriate delivery day" the customer interactively selects. In contrast, the system of claim 2 determines a range of possible delivery days for each customer predicated on statistical parameters representing the elimination rate of the inventory and variance as a proxy for risk and selects the day that yields overall optimality.

With respect to claim 5, the Examiner alleges that Kraisser discloses a method wherein days on which the deliveries can be made are variable so as to increase the number of possible route assignments for a given delivery in paragraph [0107]. Applicant disagrees.

Kraisser does not select a range of possible days but explicitly asks the user to specify "an appropriate delivery day" and appropriate time window.

With respect to claim 6, the Examiner alleges that Kraisser discloses a method wherein the forecasting step includes the step of creating at least one consumption parameter unique to the customer and a variance term in paragraph [0060]. Applicant disagrees. Kraisser instead discusses empirical business rules and does not address any specific statistical characterization of customer demand or inventory status.

With respect to claim 7, the Examiner alleges that Kraisser discloses a method comprising the steps of assigning priorities to customers to dictate the order in which commercial vehicle capacity in exhausted in paragraph [0077]. Again, Applicant disagrees. Kraisser uses priorities to assess the availability of a time window for specific customers, while the claimed system prioritizes the route allocation based on the inventory replenishment as determined by "variable statistical parameters for inventory replenishment."

With respect to claims13, 15, and 17, the Examiner alleges that Kraisser discloses a delivery forecasting system for providing periodically scheduled services in paragraph [0082]. Applicant disagrees. There is no notion of periodicity in Kraisser because all orders are independent, with the exception that customers who "regularly" order a specified amount of goods from a distributor may have a preferred status. However, the claimed "periodically scheduled services" instead refer to periodic evaluation (*e.g.*, daily, weekly, bi-weekly) of an optimal route using the demand for the consumable and/or services based on the "variable statistical parameters," not merely the fact that a customer has historically required "regular" deliveries. Put another way, Kraisser does not predicate delivery on statistical grounds based on "variable statistical parameters" but instead accommodates periodic deliveries independent of the amount of the products the customers have in inventory.

With respect to claims 19, 21, and 23, the Examiner alleges that Kraisser discloses a system wherein the variable statistical parameters include an expected consumption parameter and an estimate of the variability of the expected consumption parameter in paragraph [0077]. Again, Applicant disagrees. Applicant submits that there is a very significant difference between determining if something "makes business sense" and effectively calculating a risk function that the customer will run out of the product or miss a scheduled service based on "variable statistical parameters."

Finally, with respect to claim 20, the Examiner alleges that Kraisser disclose a system wherein the other variable parameters include a routing horizon over which customers are routed, availability of the commercial delivery vehicle, and a range of allowable days for delivery in paragraph [0107]. However, in this paragraph, Kraisser only speaks of user selected "appropriate delivery day" (singular) while the claim addresses ranges of delivery days (plural).

For the reasons set forth in detail above, Kraisser does not teach the claimed systems, methods, and program storage devices. Withdrawal of the rejection of claims 1-24 in view of the teachings of Kraisser is thus appropriate and is respectfully solicited.

Conclusion

The present response is believed to obviate the prior art rejection of record. Entry of the above amendments and issuance of a Notice of Allowability are respectfully requested.

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